Larval Survey of the Pitch Pine Looper *Lambdina athasaria pellucidaria* (G. & R.) on Cape Cod, Massachusetts

Forest Pest Management

Northeastern Area State & Private Forestry

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Introduction.--Pitch pine looper, Lambdina athasaria pellucidaria (G. & R.), a native insect of North America, is known to cause considerable foliage and crown damage to pitch, loblolly, red, Virginia, and possibly other pines. In 1971 and 1972, extensive outbreaks occurred in Delaware, Maryland, and Virginia, causing severe crown die-back and mortality to Virginia pines. Sporadic outbreaks also occurred in New York, Connecticut, New Jersey, and Massachusetts. These outbreaks appear to recur periodically in pitch pine stands in the Atlantic Coastal States.

An extensive outbreak of pitch pine looper on pitch pine has been continuing on Cape Cod since 1970. in 1973, several thousand acres (total acreage unknown) of pitch pine was defoliated by this insect. Surveys conducted in 1973 on Otis Air Force Base (now closed) indicate that considerable defoliation was caused by this insect. Crown die-back and tree mortality was also noticeable in scattered areas, probably caused by the looper, pine webworm, Nantucket pine tip moth and other insects, or by a combination of these insects and other environmental conditions. Woodlands and forested lands in several towns, and Otis Air Force Base, were sprayed with carbaryl and malathion to suppress the population. In 1974, pitch pine looper continued to cause considerable defoliation to pine stands in many areas on the Cape.

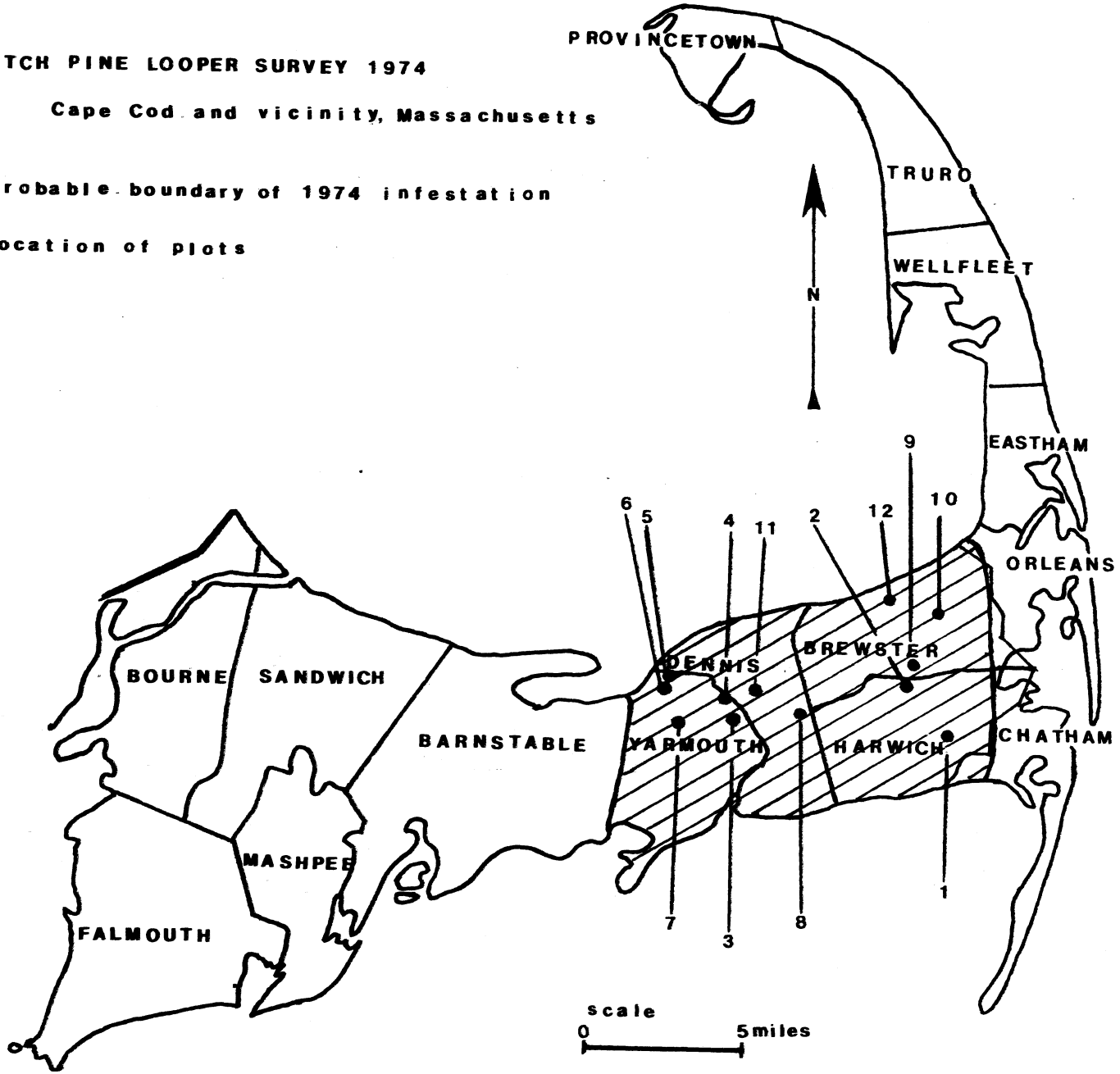
A ground detection survey was conducted on Cape Cod, Massachusetts, by Messrs. Richard Kelliher, Insect Pest Control Supervisor, Massachusetts Department of Natural Resources; and Parker Snowden, Entomologist, Portsmouth Field Office, on September 19 - 25, 1974. The purpose of the survey was to determine the intensity of the larval population in areas which sustained two or more years of consecutive defoliation (Figure 1).

Results of the survey indicated that the defoliation was light (0-25%) and the population is on a downward trend.

Survey method.--Clusters of five pine trees in each of 12 randomly selected areas were sampled to determine larval population density. An attempt was made to select areas not previously sprayed in 1973. Larval counts were made on two 18-inch branch terminals cut from each tree for a total of 120 branches. Branch samples were selected on southern exposures because larvae appear to favor the warmer side of the tree. These samples were cut from the mid-crown and dropped onto a 4' X 4' plastic drop sheet. Each sample was collected by vigorously shaking the branch to dislodge the larvae onto the drop sheet.

FIG. 1 PITCH PINE LOOPER SURVEY 1974

Cape Cod and vicinity, Massachusetts



Approximately 75 percent of the larvae were in the seventh instar (last instar) when this survey was conducted (Figure 2). The remainder of the larvae were in the fifth and sixth instars.

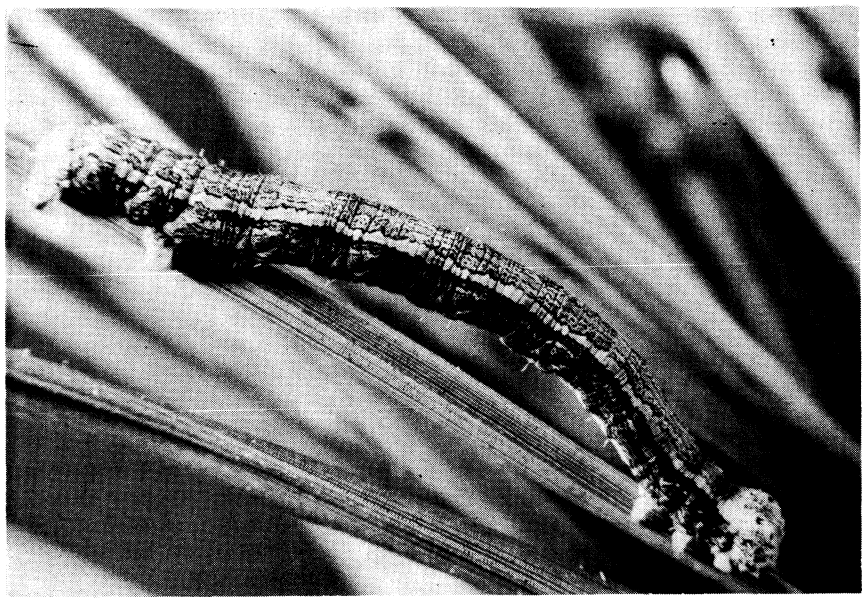


Figure 2.--Seventh instar larva of pitch pine looper on a pitch pine needle. (Approximately 37 mm long)

Categories of defoliation are listed below and are in increments of 25 percent:

9 - 25% - Light Defoliation
26 - 50% - Moderate Defoliation
51 - 75% - Heavy Defoliation
76 - 100% - Severe Defoliation

Results.--Results of the larval survey indicated that average percent of defoliation was light (0-25%). From a total of 120 branches sampled, average number of living larvae per 18-inch branch was 1.23 ± 0.68.

Discussion.--Extensive defoliation caused by the pitch pine looper in 1973 and 1974 was evident in six plots (numbers 2, 3, 4, 5, 6, 7, and 8). Current defoliation was noticeable in only one plot; i.e., number 10. In the remaining plots, old defoliation (old needles) was more conspicuous than current defoliation.

Larval population was reduced 95 percent on Otis Air Force Base when it was sprayed in 1973. Spray projects were also conducted in Bourne, Sandwich, Mashpee, and Barnstable in 1973. Results of the spraying were effective in reducing the larval population.

Seventy percent of the area sampled was in partially open, pure pitch pine stands. The remainder of the area consisted of open, mixed stands of pitch pine and red and/or white oak. Eighty percent of the trees were in the intermediate-codominant class.

Observations conducted in 1973 and 1974 indicated that pitch pine looper larvae do not consume entire needles, but chew out portions of needles causing them to turn brown. They appear to feed singly on the needles rather than in colonies.

In 1973 and 1974, 158 trees were examined; their diameter (DBH) ranged from 2.4 to 13.0 inches and their heights varied from 7.0 to 42.0 feet. Eighty-three percent of the loopers found occurred on trees having a DBH within the range of 2.4 to 6.0 inches.

Other species of insects found in association with the pitch pine looper were pine webworm, Tetralopha robustella, Nantucket pine tip moth, Rhyacionia frustrana, nesting-pine sawfly, Acantholyda probably angulata or zappei, Dioryctria spp. and gypsy moth, Porthetria dispar. Larvae of pine webworm and Nantucket pine tip moth damage were frequently encountered in this survey.

Ichneumonid parasites that attack pitch pine pupae are Coccygomimus aequalis, C. annulipes, Polytribux pallescens, Melanichneumon (Vulgich neumon) zebratus and Cratichneumon spp.[1] It was interesting to note that five tachinid pupae were found in the bottom of a rearing cage when 25 larvae were reared to pupation (Figure 2). Whether these tachinids emerged from the larvae or not is uncertain.

From all indications, a reduction or collapse will probably occur in the population in 1975. Several factors which may contribute to a population reduction are parasites or a combination of parasites and biological and environmental conditions.

Recommendations.--The Portsmouth Field Office, in cooperation with the Massachusetts Department of Natural Resources, will conduct another survey in August 1975 should there be an indication that the population is on an upward trend.

[1] Morris, C. L. Virginia Division of Forestry, Forest Pest Survey Report, May 1972.

The Portsmouth Field Office will cooperate with the Massachusetts Department of Natural Resources and University of Massachusetts in coordinating additional information on the micro-habitat, detection, and control of this insect.

References.--

Dyar, H. G. 1900. Life Histories of North America Geometridae. IX Psyche 9:21-22.

Morris, C. L. 1972. Virginia Division of Forestry, Forest Pest Survey Report: May.

For more detailed information, contact the Forest Pest Management Field Office listed below or the Area Office.

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